



Article

A boom of bones and books: The “popularization industry” of Atapuerca and human-origins research in contemporary Spain

Public Understanding of Science

0(0) 1–8

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DOI: 10.1177/0963662512437329

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Abstract

Atapuerca is an important prehistoric site in northern Spain that yielded the oldest hominid fossils in Europe in 1994. Since 1998 the three co-directors of the research team have in sum (co-)authored more than twenty-five popular science books, a boom without precedent in human-origins research. This paper will put forward three hypotheses. First, that these books were instrumental in achieving public recognition and financial support for the research project. Second, popular books on human origins serve as “enlarged battlefields” and as a meta-forum to expose new ideas to the scientific community. Third, the public visibility of these publications enables their authors to assume new roles that go well beyond their part as paleoanthropologists.

Keywords

history of science, popularization of science, science and popular culture, science communication

1. Introduction: Paleoanthropologists as authors

Popular science books do more than just divulge a simplified version of scientific knowledge to a lay audience. They synthesize but also reorganize current knowledge and often present it in new ways to a variety of audiences including the scientific community of the authors themselves (Lewenstein, 2002; Leane, 2007). These books are far less constrained than academic publications by professional standards such as peer review, disciplinary terminology and restrictions of space. Bucchi (1996: 380) described this resort to the public as “deviating” from the normal process of discussing issues within the scientific community itself.

For quite some time popular science books did not get much specific attention, despite considering that science popularization has been a major topic in recent decades in the history of science and STS (yet see the collection of articles in Bensaude-Vincent and Rasmussen, 1997). This has

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changed in the last couple of years owing to a number of publications (see Turney, 2008, for an overview). The collected volume by Hahnemann and Oels (2008) focused on Germany, Lewenstein (2009) looked at science books in the US, Lightman (2007) at Victorian Britain. In particular, popular science books on theoretical physics have been analyzed from numerous perspectives such as expounding new theories, asserting scientific authority through boundary work, recruiting new students and “disciplinary skirmishes” in the context of the science wars (Whitworth, 1996; Lewenstein, 2002; Mellor, 2003; Leane, 2007).

On the contrary, popular science books on human origins have received little scholarly attention. Landau’s *Narratives of Human Evolution* (1991) is one of the few exceptions. She studied in particular leading (paleo-)anthropologists from the early twentieth century such as Arthur Keith and Grafton Elliot Smith. Landau states that their books were far more than mere popularizations: “Often they contained the first complete expression of a scientist’s views and were seriously read and reviewed by students of human evolution” (1991: 5). She argues that in human-origins research, popular science books are as old as the field of inquiry itself, starting with the works of Charles Darwin, Thomas Huxley and Ernst Haeckel in the 1860s and 1870s (Landau, 1991: 23).

Nowadays the number of popular science books dealing with “our” origins is hard to estimate, there are so many of them. A veritable boom was triggered in 1981 by Donald Johanson’s international bestseller *Lucy: The Beginnings of Humankind* (Johanson and Edey, 1981). This new kind of book goes beyond discussing issues of human evolution in a narrow sense. The appeal of Johanson’s book is its personal style. *Lucy* was translated into Spanish in 1982 and devoured by many of the Atapuerca researchers as José María Bermúdez de Castro remembers: “Reading the book ... captivated me extraordinarily. The text brought across easily the African background and transmitted to you the passion for the riddles of the origin of mankind” (Carbonell and Bermúdez de Castro, 2004: 55). In *Lucy*-style books paleoanthropologists describe their trying fieldwork in the Ethiopian Rift Valley, their incessant quarrels with their colleagues and how they made their “path-breaking” discoveries. For the historian of science these accounts provide most valuable insights into the inner workings of research, the self-perception of the paleoanthropologists and hence the construction of their scientific personae.

2. Atapuerca and popular science books

In this paper I will look at the host of Spanish popular science books produced by the research team of EIA (Equipo de Investigación de Atapuerca) investigating the prehistoric site of the Sierra de Atapuerca in northern Spain. This research project, launched in 1978, rose to national and international fame in the 1990s thanks to spectacular finds of hominid fossils. In the Sima de los Huesos (Pit of Bones) more than 6000 fossils of *Homo heidelbergensis* have been found, currently dated at 530,000 years or older. Another site in Atapuerca, the Gran Dolina, yielded fossils that are at least 800,000 years old, at the time the oldest in Europe. This prompted the EIA in 1997 to name a new hominid species: *Homo antecessor*. The results were published in top journals such as *Science* and *Nature*.

Since 1991 the paleoanthropologists Juan Luis Arsuaga and José María Bermúdez de Castro and the archaeologist Eudald Carbonell have acted as co-directors of the EIA. Since 1998, i.e. after their rise to fame, they have in sum written or co-authored more than twenty-five popular science books. Even by the standards of their own quite prolific discipline this enormous output is without parallel in human-origins research. Yet it is not only the mass of books but also the breadth of genres that is remarkable. The researchers did not only write the typical book about what kind of skull they found and what that means for “our” origins. Arsuaga’s publications include a portrait

of the site of Atapuerca narrated by fictitious characters (e.g. tourist guides) (2004), a novel from the Palaeolithic (2005) and a children's book (2008). Carbonell and Bermúdez de Castro (2004) co-authored a book about the history of the EIA in the form of a dialogue between them. Not all of their popular science books deal exclusively with Atapuerca and some hardly mention the site at all. Arsuaga for example published a book about the role of food in human evolution (2002) and one about Charles Darwin (2009). Bermúdez de Castro (2010) wrote about the evolution of the human mind and Carbonell (2007, 2008; Carbonell and Sala, 2002) authored a series of rather philosophical works about the need to "socialize" knowledge in order to complete the process of "humanization."

Economically speaking Arsuaga's books are by far the most successful ones. His first popular science book, *The Chosen Species* (Arsuaga and Martínez, [1998] 2006), was a number one best-seller in non-fiction in Spain and sold more than 100,000 copies in the first three years (Corbella, 2002). It has so far gone through more than 30 editions. Arsuaga's second book, *The Neanderthal's Necklace*, alone sold 15,000 copies in the first month after its publication in 1999 (Corbella, 1999). Since 2003 there have been 17 paperback editions totalling 44,000 copies. Internationally it had the greatest impact with translations into French (2001), Italian (2001), Catalan (2003), English (2003), German (2003), Dutch (2004) and Portuguese (2007). Arsuaga's later books still had a high print run by Spanish standards, e.g. *El enigma de la esfinge* (2001) had 27,000 copies (hard cover) and 14,600 in two later paperback editions; *El mundo de Atapuerca* (2004b) had a print run of 30,000 copies. The books by Bermúdez de Castro have significantly smaller print runs. For example, *The Evolution of Talent* (2009) had 4600 copies and 3000 in the paperback edition of 2010. Similarly, the books by Carbonell usually sell between 3000 and 5000 copies.

In a sense, these books filled a void. The market for popular science books in Spain in the late twentieth century was still relatively small. That is how Bermúdez de Castro explains the "irresistible success" of Arsuaga's *The Chosen Species*: it was the first Spanish popular science book about human evolution, a subject of which the public knew nothing (Interview with author, 2011).

3. The origins industry of Atapuerca

As a Spanish journalist observed: "An industry of popularization, literature, tourism and scientific spectacle has been built around Atapuerca" (Miravalls, 2007). Numerous articles in newspapers and magazines, television documentaries, exhibitions, internet sites, blogs, visitor centres near and guided tours through the site and most recently a *Museum for Human Evolution* in Burgos that cost 70 million Euros all contribute to the public projection of Atapuerca. In most of these formats the three co-directors play a leading role as authors, bloggers, curators, guides for VIPs, film-makers and so on. Casado (2009: 29) notes that the Atapuerca team leaders "dedicated themselves from the start to the merchandizing fever in order to publish their scientific news." The most obvious objective of these "excesses of popularization" (Casado, 2009: 29) was to achieve public recognition and consequently funding for the EIA. Carbonell (2007: 106) himself claims that the public projection of Atapuerca "has been created intentionally" in order to enable the EIA to pursue their research "in acceptable conditions." The large number of popular science books forms part of this multi-media "popularization industry." Yet is there anything particular about them? Obviously there is a lot of overlap between the different media that are deployed. For example the constant superlatives about Atapuerca being the most important prehistoric site in Europe or even in the world crop up in all the different formats (for the books see Arsuaga, [1999] 2004a: 205; Carbonell and Bellmunt, 2003: 137).

Many of the stories and anecdotes about their major discoveries that the co-directors relate in their books have been told before or were elicited in interviews by journalists. The trajectory seems to be leading from the “small” forms (popular articles, interviews, blog entries and so on) to the “large” form, the book (and to a much smaller extent the other way round). So in a sense these narratives tend to coagulate in these books. Told and retold they shape the “folklore” of Atapuerca. Yet I would argue that these books are more than a receptacle of content that has been created in other media. The medium of the popular science book offers specific opportunities for scientists that are not (or are to a much smaller degree) available to them in other media. They have to do with the large space – i.e. hundreds of pages – available to book authors and the more permanent, hence less ephemeral character of this medium in comparison with newspapers and so on. The remainder of this article will focus on how the three co-directors of the EIA use the medium of the popular science book in this distinctive sense.

4. A space to speculate, to learn and to campaign

Surely the motivations of Arsuaga, Bermúdez de Castro and Carbonell to write these books are mixed and cannot be reduced to a single one. The freedom provided by the popular science book is certainly one. The format allows for a critical synthesis of current research, the discussion of overarching questions and speculations on the course of human evolution. It is very difficult to put forward, for example, a new theory about the Neanderthals in a peer-reviewed journal demanding brevity and original data. In *The Neanderthal's Necklace* Arsuaga ([1999] 2004a) argues that despite their “humanity” and their cognitive abilities, Neanderthals did not use symbolic representations. Therefore they could not compete with *Homo sapiens* and finally went extinct. The English translation of this book was reviewed in several academic journals, indicating that it is considered a contribution to the scientific discussion (Bisson, 2004; Clark and Thompson, 2004).

Bermúdez de Castro considers his first popular science book (2002) a “scientific book.” For the first time he put together material he had collected for 15 years on how the teeth of hominids develop. Having to explain to a lay audience what dentition can tell us about the growth of an individual during childhood and adolescence helped him to better understand it himself (Interview with author, 2011). “In our books we write what we cannot say in our scientific articles” Carbonell told me (Interview with author, 2010). Yet he thinks less of a specific scientific theory but rather of his political agenda (see below).

It has long been recognized by STS scholars that the public domain may serve as a creative space for science: “Highly controversial or speculative topics could be discussed there far more easily than would have been possible through normal channels within the science system” (Felt, 2000: 30; cf. Cassidy, 2006: 179). As the example of Atapuerca shows the three co-directors use this freedom in different ways: to put forward a controversial theory (Arsuaga), as an “autodidactic” means to improve one’s own understanding of the subject matter (Bermúdez de Castro) or as a tool for a political agenda (Carbonell). The intended audience varies accordingly between the scientific community and the public at large.

5. Telling one’s own history

Quite a few of these books on Atapuerca deal in parts or even entirely with the history of the excavations. They tell a story of epic struggle, perseverance and eventual vindication. Routinely it is pointed out that the EIA had a hard time financing the excavations (e.g. Díez et al., 2009: 152). The Spanish researchers do not dig for fossils in the Ethiopian desert yet the Pit of Bones

provides the stage for at least some drama. Working in the cramped conditions of this cave located deep within the Sierra de Atapuerca proved extremely difficult and even dangerous. Once they nearly suffocated. Tons of sediments had to be hauled out in rucksacks through narrow passages. Only through sheer willpower and unshakable belief in their project they kept going (Aguirre et al., 2002: 28; Arsuaga, Carbonell and Bermúdez de Castro, 2003: 84f.; Carbonell and Bermúdez de Castro, 2004: 105–118, 276). For years they only found fragments of hominid fossils; the period of 1988–1991 was labelled “the dark years” (Cervera et al., 1998: 91). With the spectacular finds of the 1990s the EIA was rewarded for their endurance (Arsuaga and Martínez, 2004: 66f., 74; Carbonell and Bermúdez de Castro, 2004: 109).

This narrative of hardship and reward is complemented by the narrative of a successful struggle of the EIA against the threat of “foreign dominance.” The history of Spanish prehistoric research has often been told as one of exploitation by and disrespect from foreign scholars. The initial denial by a French archaeologist of the authenticity of the Altamira cave paintings, discovered in 1879 by a Spanish amateur scientist, still provides the prime example for this alleged “scientific colonialism” (Casado, 2009: 38). This feeling of inferiority still surfaces in the histories of the Atapuerca project (Arsuaga and Martínez, 2004: 66; Carbonell and Bermúdez de Castro, 2004: 57, 276). Bermúdez de Castro (2002: 42) recalls that until very recently the “important things” in human-origins research had nearly always been achieved in the UK, France and the USA. Yet the naming of a new species, that is *Homo antecessor* by a Spanish team in 1997, put the country on the map. The project of Atapuerca was a highly unlikely success for Spanish science, Carbonell and Bermúdez de Castro (2004: 27; similarly Carbonell and Bellmunt, 2003: 161) agree. For Carbonell their discoveries constitute the most important contribution of Spanish science since the physiological work of Ramón y Cajal (Nobel Prize in 1906) (Aguirre et al., 2002: 66). The researchers stress the importance of turning Atapuerca into a “Spanish” project, serving as a training-ground to professionalize Spanish human-origins research (Carbonell and Bermúdez de Castro, 2004: 172f.).

All these elements – the self-description as underdogs eventually reaching international acclaim, the national framing of the discoveries and the EIA as a paradigm to be emulated by Spanish science – are crucial elements of the popularization industry of Atapuerca. Yet I would argue that the popular book – often lavishly illustrated and with detailed chronologies – allows for telling one’s own history in the most comprehensive and authoritative way seemingly without interlocutors. A review of *The Neanderthal’s Necklace* duly noted that “Arsuaga also wants to showcase modern Spanish palaeoanthropology” (Clark and Thompson, 2004: 141).

6. Admonishers, critics, prophets – assuming new roles

Fernández (2004: 206) already observed that in interviews the co-directors of Atapuerca talk more about moral and philosophical issues than about their field of investigation. Again I would suggest that looking at their books is the best way to understand how the authors conceive of themselves. All three co-directors, to various degrees, have used the medium of the popular science book to address topics that go well beyond their research at Atapuerca or human-origins research in general. Arsuaga often writes about his experience of nature and would like the reader of his books to feel the same shudder when he approaches the “Sierra de Atapuerca, the holy mountain” (Arsuaga, [1999] 2004a: 22f.; cf. Carbonell and Bermúdez de Castro, 2004: 84f.). In his most recent book Arsuaga decries the ecological destruction of the earth and pleads for sustainability (Arsuaga and Algaba, 2010). He takes the part of the admonisher, reminding his readers that human beings have always existed in a very close relationship with their environment.

The Evolution of Talent (2010) bears the subtitle *How our origins determine our present*. It was the publisher who chose the subtitle, Bermúdez de Castro told me, but he himself considers it very appropriate. Throughout the book he emphasizes the “biological basis” of our behaviour. Talking about the struggle for power, he states that “we have not changed at all in six million years of evolution” (Bermúdez de Castro, 2010: 162). He assumes for example that there is some kind of “natural leadership” with a “certain genetic base” which has not yet been discovered (p. 191). He proposes territoriality as a defining feature of ourselves because it is part of our evolutionary inheritance. This kind of argument puts Bermúdez de Castro in the camp of evolutionary psychology (cf. Cassidy, 2006).

Carbonell has written an entire series of books expounding his idea of “the socialization of knowledge.” While the biological process of “hominization” is complete, the cultural process of “humanization” has still not been accomplished. Science is a “social instrument” that is crucial in order to overcome social hierarchies and gender inequality. With its blessings equally distributed, technology will free us from the mechanisms of natural selection. If humanity should fail to accomplish this “revolution,” our species may face extinction, Carbonell (2008: 174) predicts, bordering on the apocalyptic. Although his political agenda remains quite vague, Carbonell fashions himself as a man with a mission to reform society. He describes himself as a Marxist, but also as a Catalanist in favour of far-reaching autonomy for Catalonia from the central government of Spain. He writes all his books in Catalan, which are in most cases immediately translated into Spanish. His most recent book, which appeared in July 2011, is entitled *Catalanisme evolutiu* (“Evolutionary Catalanism”) (Carbonell and Bellmunt, 2011). He proposes his concept of “the socialization of knowledge” in order to overcome the current “crisis in politics and in society.”

Backed by their scientific credentials and their public visibility all three co-directors address a variety of political and social issues. For them Atapuerca provides a public stage to act as admonishers, as advocates of “Spanish” science, as experts of “human nature” or as social reformers. The public sphere is their pulpit, and their popular science books are their loudspeakers.

It is, of course, no new phenomenon that scientists who have prestige and writing skills assume new roles in the public discourse. “Public scientists” such as Noam Chomsky, Stephen Jay Gould or Richard Dawkins immediately come to mind. With respect to the Atapuerca researchers the Austrian ethologist Konrad Lorenz might come closest as a model, combining in his highly successful popular science books the role of an evolutionary psychologist (*avant la lettre*), nature conservationist and warning prophet in one powerful scientific persona (Taschwer and Föger, 2003: 59, 149f.). Lorenz is one of Arsuaga’s most cherished authors, in particular his book *On Aggression* (1963) (Arsuaga, 2001: 253, 404; [1999] 2004a: 382–384; 2009: 47, 48, 178; Arsuaga and Martínez, [1998] 2006: 384, 423; also see Carbonell and Bellmunt, 2003: 73).

7. Conclusion

What can be said about the reception of the books? Arsuaga’s first book, *The Chosen Species*, is used as a textbook in Spanish universities (Diez et al., 2009: 188). Bermúdez de Castro told me that his “science book” (2002) is one of the most Xeroxed works by university students in Spain. This shows that the audiences of a popular science book can be quite diverse: such a book does not only address the general public, it is also used by students and discussed by fellow researchers, e.g. in reviews. The Spanish media generally announce these books through reviews or interviews with the authors. Yet these “reviews” rarely contain more than a synopsis of the book and are virtually without exception affirmative. This embrace is representative of the symbiosis between the EIA and the Spanish media. Both relish in the success and the international recognition of the research project.

Popular science books are only a part of the multi-fold efforts of the EIA to make their work known. Yet owing to their length, rich content, sheer mass as well as the breadth of genres, these books are key in order to understand the popularization industry of Atapuerca. They show how the paleoanthropologists perceive themselves and their work. They can narrate their own story, assuming their place as overcoming foreign dominance and establishing a highly respected “Spanish” science. In their books it becomes most clearly visible what new roles they assume and what kind of agenda they intend to pursue beyond their own scientific discipline.

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